

DEVELOPMENT AND EVALUATION OF SAUCE FROM BILIMBI FRUIT AND CURRY LEAVES

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ABSTRACT:

Averrhoa bilimbi fruit conserve is administered as a treatment for coughs, beri-beri and biliousness. Syrup prepared from the fruit is taken as a cure for fever and inflammation and to stop rectal bleeding and alleviate internal hemorrhoids. The formulation of the bilimbi sauce represents the healthy ingredients based on the composition of the bilimbi sauce that can provide nutritional benefits to its consumers. Likewise, it can also be a potential commercial product that can be produced to address some nutritional deficiency issues. The availability of the fruit and the affordability of the bilimbi sauce can motivate people to use this product as a staple commodity that can provide nutritional benefits to its consumers. The nutritional content of vitamins, protein, carbs, and other minerals were provided by the processed bilimbi fruit formed into a bilimbi sauce when coupled with necessary components. The miracle bilimbi sauce, which is made from the bilimbi fruit, has a high nutritional value, making it a cheap alternative to vitamins that can improve the health and wellbeing of its users. It is even more of a revelation among the great names in the culinary industry due to its exceptional, underappreciated nutritional content. This study demonstrates its nutritional qualities while also highlighting its potential operational utility.

INTRODUCTION

Nowadays people mostly insist on fast foods and forget the traditional food items and their effects on health. The health of the people was affected and the children have no proper growth. In this study “DEVELOPMENT AND EVALUATION OF SAUCE FROM BILIMBI FRUIT AND CURRY LEAVES.” the properties of Bilimbi Fruit and its role in the body were discussed. With this view, the present study was resulted that Bilimbi fruit when incorporated and formulated increases the Nutritional Benefits. Averrhoa bilimbi is

a small tropical tree native to Malaysia and Indonesia, reaching up to 15m in height. It is often multitrunked, quickly dividing into ramifications. Bilimbi leaves are alternate, pinnate, measuring approximately 30–60 cm in length.

Averrhoa bilimbi fruit conserve is administered as a treatment for coughs, beriberi and biliousness. Syrup prepared from the fruit is taken as a cure for fever and inflammation and to stop rectal bleeding and alleviate internal hemorrhoids. Bilimbi contains lots of Vitamin, Minerals and other components. Among these some of the vitamins that Bilimbi has Vitamin C, Vitamin A, Folates, Thiamine, Niacin, Pantothenic acid and Choline. Bilimbi also contains Omega 3 fatty acids, Omega 6 fatty acids, dietary fiber, sodium and potassium, which have lots of health advantages. Apart from this Bilimbi also contains minerals such as calcium, magnesium, manganese, selenium, phosphorous, iron, protein, zinc and copper. The best part of the Bilimbi is, it contains zero cholesterol.

MATERIALS AND METHOD

The study was conducted at AlBiosys Biotech Research Institute, Kochi. It deals with the materials and methods adopted in present study entitled “Development of bilimbi sauce (*Averrhoa bilimbi* L.) with curry leaves”. Combined with other ingredients like salt, chilli, pepper etc. Collection of raw materials, preparation of the ingredients, mixing of the ingredients and preparation of the sauce were the major steps in this.

Materials needed for product development: Bilimbi fruit, Curry leaves, Cinnamon, Cloves, Cardamom, Black pepper, Salt, Acetic acid, Garlic, and Chilli. The raw materials for the preparation of product are collected from Bilimbi Tree and Bismi Hypermarket, Kochi. Equipment used: Stainless steel stirrer, Cooking pan, Grinder, Sieve, weighing balance, one clean bowl, Whisk, Muslin cloth gas stove, Gas stove, Ladle, Knife, Chopping board.

METHODOLOGY

The bilimbi were washed properly, and the sides were cut. The seeds were taken out and washed again, then boiled still with water in preparation for sauce. The seeds were taken out, washed and mashed. It was then weighed in to achieve the right consistency to give way to the other ingredients. The other ingredients include curry leaves, cardamom, fennel seeds, cinnamon, cloves, pepper, acetic acid, garlic, chili and salt mixed with specific measurements. Boil the bilimbi fruit and some Chili in a deep non-stick pan mix well Cook

until its colour changes from green to yellow (softens). Take cinnamon, cardamom, cloves, pepper, ginger make into a kizhi and dip during boiling.

Keep aside and let it cool. Then blend the bilimbi, curry leaves, chili in a mixer to smooth Puree paste. After blending bilimbi into smooth paste add salt and blend until smooth. Cook until the end point is reached, add acetic acid and the sauce is ready. Remove the sauce from the heat. Sterilize the bottle sauce. Pack the sauce and place it into the sterilized bottle. Cool the bottled bilimbi sauce and put the label after it is covered.

The formulation of the bilimbi sauce represents the healthy ingredients based on the composition of the bilimbi sauce that can provide nutritional benefits to its consumers. Likewise, it can also be a potential commercial product that can be produced to address some nutritional deficiency issues. The availability of the fruit and the affordability of the bilimbi sauce can motivate people to use this product as a staple commodity that can provide nutritional benefits to its consumers.

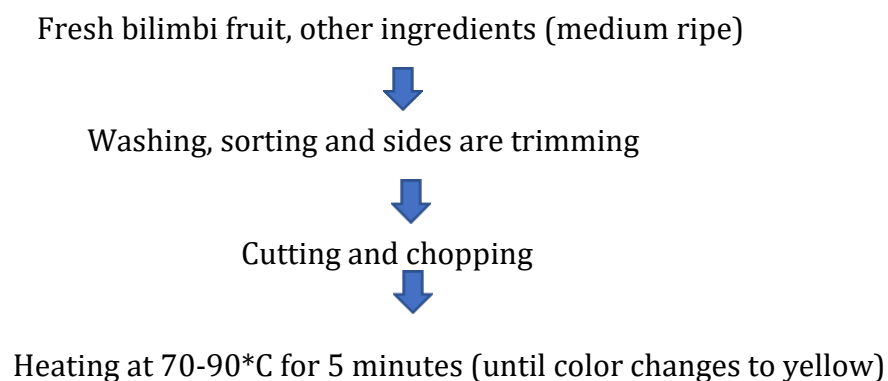
INCORPORATION OF CURRY LEAVES POWDER AND STANDARDIZATION

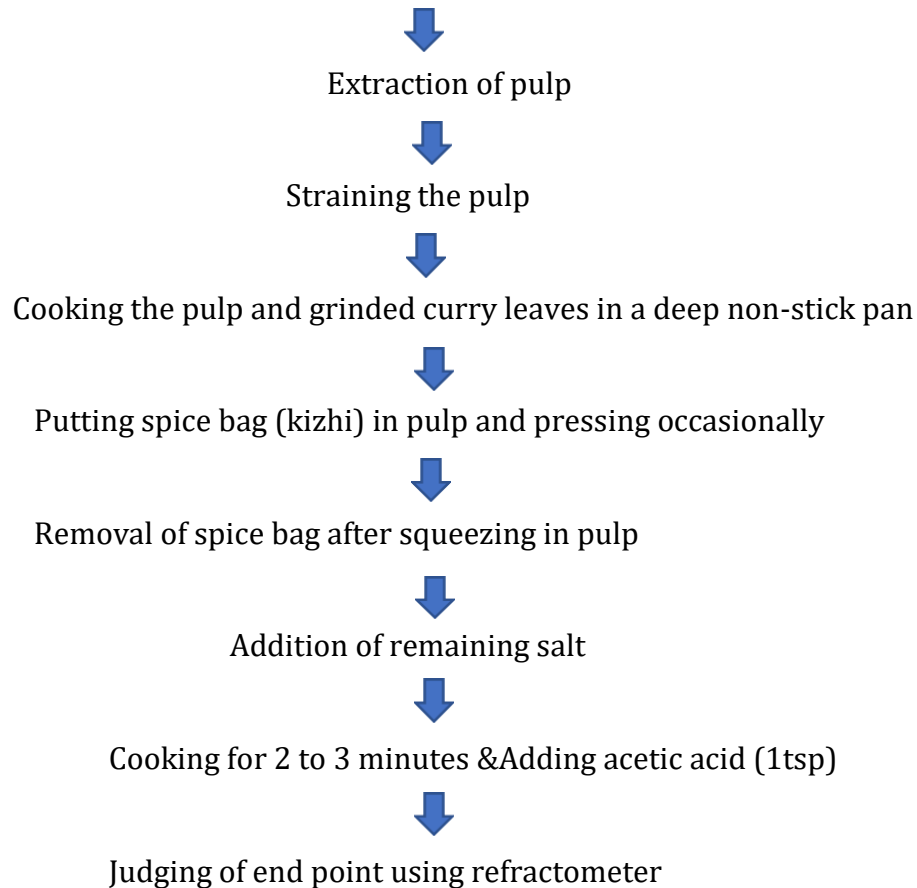
To analyse the most acceptable proportion of the product was incorporated with Curry Leaves at 4%, 6%, and 8%. From this variation the best proportion was selected through sensory evaluation. It also compared with the standard.

Here, mainly three compositions of sauces were prepared by varying the quantity of bilimbi fruit and also other two ingredients.

Ingredient	Bilimbi Fruit	Curry leaves
Sample 1	80g	8g
Sample 2	100g	5g
Sample 3	192g	4g

Preparation Flow Chart





RESULT AND DISCUSSION

MEAN SENSORY ANALYSIS OF DEVELOPED FOOD PRODUCT

The organoleptic quality of the product was determined with the help of panel of judges using 1-5 scale. The aspects considered were appearance, flavour, colour, taste, and texture. The average score of all the different panellist were computed for appearance, flavour, colour, taste, and texture.

TOTAL MOISTURE CONTENT

Moisture content influence the taste, texture, weight, appearance, shelf life of food stuffs. Hence, obtaining an optimal analytical value for moisture is of great economic importance to a food manufacturer. Moisture content is one of the most commonly measured properties of food materials. its control greatly influences the physical properties and product quality of nearly all substance and materials at all stages of processing and final product existence.

$$\% \text{ of moisture} = [(W_1 - W_2) / (W_1 - W)] \times 100$$

Treatment	Product
Total moisture (%)	9.97%

CARBOHYDRATE CONTENT

The total content of carbohydrate present in the food product was quantified. According to the phenol anthrone reagent method, the optical density was taken in the spectrophotometer after which optical density at 630 nm gave a straight line graph where mentioned the concentration and percentage of carbohydrate. The percentage of carbohydrate were detected on the basis of a equation of straight line is $y = mx$ represented in the graph where m is the concentration, the y represents the optical density of the standard.

TOTAL CALORIE

Total calories of the sample were calculated by the formula

Total calories = Fat \times 9 + Protein \times 4 + Total carbohydrate \times 4

Treatment	Product
TOTAL CALORIE	101 Cal

pH VALUE

Value pH determined pH meter.

Treatment	Product
TOTAL pH	7.1

TOTAL SOLUBLE SOLIDS

This is measured using a refractometer, and is referred to as the degree's bricks.

Treatment	Product
TSS	48 ⁰ brix

CONCLUSION

The processed bilimbi fruit made into a bilimbi sauce combined with essential

ingredients provided the nutritional value of Vitamins, protein, carbohydrates, and other minerals. The high nutritional value of this bilimbi fruit and its consumption through this wonder bilimbi sauce can serve as an affordable vitamin substitute that can promote good health and well-being to its consumers. Its unique, underrated nutritional value makes it even more, a revelation among the big names in the gourmet world. This study proves its nutritional attributes at the same time to make known its potential operational utility. On the other hand, the chemical components with their nutritional value contribute to its bio-activity are essential to the plant industry, biotechnology, and biomedical fields. The use of curry leaves enhances the sensory attributes in terms of flavor and texture on the bilimbi sauce with an acceptable concentration of 50%. The development of value-added products from kamias fruits made into bilimbi sauce can generate good nutrition in the community and livelihood in different localities in the India, which can also be replicated in other countries.

With the need to improve health and well-being, especially during the pandemic, future studies on this topic are highly recommended to provide varied contexts on its health effects and its nutritional impact on consumers and health enthusiasts. Similarly, an economic impact analysis study is also recommended.

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